for the possible benefit of an acre of corn during the crop season would be equivalent to 1 horse-power for 22 seconds; and the heat evolved by $1,000 worth of radium on an acre of land in 100 days would be less than the heat received from the sun on one square foot in 30 seconds.

CYRIL G. HOPKINS,
WARD H. SACHS
UNIVERSITY OF ILLINOIS

SPECIAL ARTICLES

NEW REPTILES FROM THE TRIAS OF ARIZONA AND NEW MEXICO

BEGINNING the later part of March, 1914, the University of Wisconsin paleontological expedition spent two months in Arizona and New Mexico collecting Triassic vertebrates. The time was divided chiefly between two localities, Wingate, New Mexico, nine miles east of Gallup, and along the Little Colorado River some fifty miles northeast of Flagstaff, Arizona. In both localities material was collected which should add substantially to our knowledge of the Triassic vertebrate faunas of the west.

Conspicuous among the collections are Phytosaur remains of various types. One nearly complete skull, apparently the largest yet discovered, will probably prove to be a new form.

One of the most interesting finds from the Wingate region is that of a nearly complete pelvic girdle of distinctive form. The sacrum consists of two closely united vertebræ with moderately biconcave centra. The neural arches are massive and are surmounted by stout, comparatively short spines with considerably expanded tops. The sacral ribs unite broadly with the arch and centrum, each rib being supported by a single vertebra. Distally the ribs are greatly expanded in an antero-posterior direction and are considerably thickened below and apparently down curved along the inner side of the ilium.

The upper portion of the ilium is expanded both laterally and in an antero-posterior direction into a broad, horizontal shelf. The ischia meet along the median line in a trough-like union that extends back in a horizontal tongue-shaped process. The pubes take a comparatively small part in the floor of the pelvic opening as the lower anterior portion of these elements extends directly down in a broad plate-like expansion at right angles to the vertebral column. The lower outer corner of the pubic expansion is swollen into a foot-like process, possibly to bear a portion of the weight of the creature when at rest.

All three elements enter the imperforate acetabulum in a firm union. The acetabulum is large and deeply concave and set off by a prominent raised boundary. It is directed out and down and considerably back. The girdle measures about 450 mm. from the top of the sacral spines to the lower border of the plate-like expansion of the pubis. The greatest width, at the lateral expansion of the upper portion of the ilia, is approximately 370 mm.

The massive construction of the girdle has suggested the name *Acompsosaurus wingatensis* for this new form. It is to be hoped that other material in the collections will add a knowledge of other parts of the skeleton. Figures and a more complete description of *Acompsosaurus wingatensis* will follow in another place.

MAURICE G. MEHL
UNIVERSITY OF WISCONSIN

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 539th meeting of the society was held in the Assembly Hall of the Cosmos Club, Saturday, April 3, 1915, called to order by President Bartsch at 8 P.M., with 65 persons present.

On recommendation of the council, Mr. Ben Miller was elected to active membership.

Under heading Brief Notes, Dr. L. O. Howard called attention to a wasps' nest he had lately seen which was marked by a conspicuous blue streak. In making this nest the wasps had evidently made the blue streaked part out of a blue building paper, instead of making their pulp from the natural wood. Messrs. Bartsch and Lyon referred to the red-headed woodpeckers in the grounds of Freedmen's Hospital, stating that a few birds had remained during the winter of 1914–15, though none had wintered during 1913–1914. The species is abundant in the hospital grounds this spring. Messrs. Bartsch and Bailey

commented upon the scratching of the gray squirrels in the city parks, which Mr. Bailey said was due to infestation with fleas from their winter boxes. Suitable insect powder placed in the boxes would drive out the fleas, but was not relished by the squirrels.

The first paper on the regular program was by Dr. A. H. Wright, of Cornell University, "The Snakes and Lizards of Okefenokee Swamp." Dr. Wright said:

Seven snakes of the dry open sandy fields or pine forests of southeastern U. S. were absent on the Okefenokee Swamp islands. None of the truly Floridan ophidians and saurians were represented. Some forms occurred on the outskirts of the swamp but were wholly wanting within the swamp. The 21 species of snakes and 6 lizards were very variable in scutellation and coloration. Whether the restricted quarters and the incessant warfare and struggle for place caused the wide range of variation is not yet answerable. We had expected to find fixed peculiar stable races or subspecies because of the isolated nature of some of the islands, but segregation has not yet placed a local stamp on any of the reptilian forms. The swamp is the common source of the Atlantic coastal stream, the St. Mary's, and the Gulf affluent, the Suwannee. This factor may have had its influence on the turtles and possibly on the snakes and lizards. The swamp does not appear to be a barrier or boundary line between two decided faunal areas. It is rather a melting pot for many of the supposed cardinal characters of distinction in snakes and lizards.

Some of the interesting systematic observations are: the nontrustworthiness of the temporal scutellation and coloration in the *Elaphe* group; the need of further study in the *Tropidonotus fasciatus* assemblage; the presence of the *Osceola elapsoidea* and the *Lampropeltis doliatus coccineus* characters in one and the same specimen; the reduction of *Diadophis amabilis stictogenys* to *D. punctatus;* the non-recognition of *Ophisaurus ventralis compressus;* the presence of white-bellied adults and young of *Farancia;* the possibility of *Heterodon niger* as an end phase of coloration and a query as to the loss of the azygous in *Heterodon browni;* the overlapping in scale rows and ocular formulæ in *Storeria occipitomaculata* and *S. dekayi;* the fact that no two heads of the *Sceloporus undulatus* specimens had the same plate arrangement; and the unreliability of the mental characters in *Plestiodon,* our specimens of *P. quinquelineatus* falling into two of Cope's major groups, if determined on mental scutellation.

Dr. Wright's paper was illustrated by lantern slides showing views of the swamp, of its reptile inhabitants, and of the variations found in certain of the species. His communication was discussed by the chair and Messrs. Wm. Palmer and Hugh Smith.

The second and last paper of the program was by Dr. Arthur A. Allen, of Cornell University, "The Birds of a Cat-tail Marsh."

Observations on the food, nesting habits and structure of marsh birds showing the limitations of specialized species as to food, distribution and power of adaptability and the dominance of generalized forms were made.

Specialization in birds goes hand in hand with a high development of the instincts, but with a low degree of intelligence and little adaptability. Generalization of structure, on the other hand, occurs with a weaker development of the instincts, greater intelligence and greater adaptability. The generalized, adaptable species persist through the ages, while the specialized, non-adaptable are first to go. This is seen in the birds of a cat-tail marsh.

Seven stages are recognized in the formation of a marsh, represented in the mature marsh by zones of typical vegetation or plant associations, these associations following one another in regular succession. Similar associations and successions can be recognized among the birds if we group them according to their nesting range in the marsh. Most species are not confined to one association, although reaching their maximum of abundance in it. The generalized, adaptable species have the widest range.

The various associations with their typical birds follow:

I. The Open-water Association; important in supplying forage, but with n nesting birds.
II. The Shoreline Association, with the pied-billed grebe, a specialized non-adaptable species.
III. The Cat-tail Association, with the least bittern, coot, Florida gallinule, Virginia rail, Sora rail and red-winged blackbird, finding optimum conditions.
IV. The Sedge Association, with the long-billed marsh wren, bittern, swamp sparrow, short-billed marsh wren, and marsh hawk.
V. The Grass Association, with the song sparrow and Maryland yellowthroat.
VI. The Alder-Willow Association, with the green heron and alder flycatcher.
VII. The Maple-Elm Association, with the black-crowned night heron, and great blue heron of the marsh birds and a great variety woodland species.

Of all these species the one most generalized in habit and structure is the red-winged blackbird. It, too, is the most adaptable and is the dominant species in the marsh.

Dr. Allen's paper was illustrated by numerous lantern slides from photographs of the marsh, its bird inhabitants, and their homes, and by motion pictures of the least bittern and of the canvas-back and other ducks.

Dr. Allen's paper was discussed by Dr. L. O. Howard.

The society adjourned at 10.15 P.M.

M. W. Lyon, Jr.,
Recording Secretary